

STUDIES IN THE THEACEAE, XIV  
NOTES ON THE WEST INDIAN SPECIES OF *TERNSTROEMIA*

CLARENCE E. KOBUSKI

IN 1896, Urban (Bot. Jahrb. **21**: 521–544) presented an excellent and rather complete treatment of the West Indian species of *Ternstroemia*. The present contribution is hardly more than a review based upon Urban's work. As a result of study of the American species as a whole, I feel that Urban placed too much significance on the extent of connation in the petals and on other variable characters, using them extensively in his key to the species. Furthermore, the new species, which were described under the joint authorship of Krug and Urban, were often based on minor and variable characters. Nearly every number collected by C. Wright in Cuba was designated as a new species or variety. These species are not outstanding and in several instances have been reduced to synonymy in this paper.

In my presentation of the South American and the Mexican and Central American groups (Jour. Arnold Arb. **23**: 298–343, 464–478. 1942), complete description of all the species were offered, many of them for the first time. However, in the present paper, because of Urban's very carefully drawn descriptions, it is unnecessary to continue this practice, and instead only the salient characteristics, along with discussions of specific relationships and differences, are recorded. Here, for the first time, to my knowledge, is mentioned a pubescent species of *Ternstroemia*, *T. pubescens* from Santo Domingo.

KEY TO THE SPECIES

- A. Pedicels, bracteoles, calyx-lobes, lower surface of leaves and current year's growth covered with a short villous pubescence (Santo Domingo) . . . . .1. *T. pubescens*.
- AA. Entire plant strictly glabrous.
  - B. Ovary and fruit one- or three-celled.
    - C. Ovary three-celled.
      - D. Leaves membranaceous, not granular-punctate; stigma subcapitate, tri-crenate; each ovary cell single-seeded (Trinidad, French Guiana). . . . .2. *T. delicatula*.
      - DD. Leaves heavy-coriaceous, densely granular-punctate on both surfaces; stigma three-parted, evolute; ovary cells more than one-seeded (Guadeloupe, Martinique, St. Kitts, Dominica) . . . . .3. *T. elliptica*.
    - CC. Ovary one-celled . . . . .4. *T. parviflora*.
  - BB. Ovary two- or four-celled.
    - C. Ovary four-celled (Tobago, Trinidad) . . . . .5. *T. oligostemon*.
    - CC. Ovary two-celled.
      - D. Pedicel with four bracteoles in two opposite pairs (Porto Rico) . . . . .6. *T. heptasepala*.
      - DD. Pedicel with two opposite bracteoles.
        - E. Flowers and fruit sessile or subsessile (Jamaica) . . . . .7. *T. subsessilis*.
        - EE. Flowers and fruit distinctly pedicellate.
          - F. Calyx-lobes remarkably large, the smallest over 1 cm. long (1.2–1.7 cm.).

- G. Calyx-lobes glandular-denticulate, up to 17 mm. long; bracteoles 7-9 mm. long, ovate, eglandular; pedicels 1.5-2.0 cm. long (Jamaica).....8. *T. calycina*.
- GG. Calyx-lobes eglandular, 10-12(-14) mm. long; bracteoles minute, not over 3 mm. long, acuminate; pedicels 6-8 cm. long (Jamaica).....9. *T. rostrata*.
- FF. Calyx-lobes under 1 cm. long.
- G. Calyx-lobes and bracteoles eglandular.
- H. Leaves elliptic-oblong, 2-3 times longer than broad, acute at apex, up to 12 cm. long (Porto Rico). 10. *T. luquillensis*.
- HH. Leaves broadly ovate-elliptic, suborbicular, rounded and lightly emarginate at apex, 3-4 cm. long, 3-4 cm. wide (Haiti).....11. *T. Barkeri*.
- GG. Calyx-lobes and bracteoles glandular-denticulate.
- H. Bracteoles long, conspicuous, linear, foliar, up to 6 mm. long (Haiti).....12. *T. Nashii*.
- HH. Bracteoles seldom over 3 mm. long, not foliar and usually inconspicuous.
- I. Largest leaves less than 3 cm. long.
- J. Outer calyx-lobes very small, ca. 2.0-2.5 mm. long; bracteoles not over 1.5 mm. long, not keeled (Haiti).....13. *T. Selleana*.
- JJ. Calyx-lobes 4-6 mm. long; bracteoles 2-4 mm. long, keeled.
- K. Leaves rounded, spathulate, not revolute; bracteoles long-deltoid, ca. 3 mm. long (Haiti).....14. *T. gracilifolia*.
- KK. Leaves thick-coriaceous, ovate or broadly ovate, revolute; bracteoles shortly triangular, acute, ca. 2 mm. long (Cuba).....15. *T. flavescens*.
- II. Largest leaves well over 3 cm. long.
- J. Pedicels less than 1.5 cm. long.
- K. Pedicels very short, 0.5-0.9 cm. long, usually averaging 0.6 cm.
- L. Leaves nearly orbicular (Cuba).....16. *T. baracoënsis*.
- LL. Leaves elliptic-oblong, usually 2½-3 times longer than broad (Cuba).....17. *T. cernua*.
- KK. Pedicels 1.0-1.5 cm. long; calyx-lobes 3 mm. or less (Cuba).....18. *T. microcalyx*.
- JJ. Pedicels longer than 1.5 cm., usually much longer, in some cases up to 8 cm.
- K. Calyx-lobes distinctly sharp-pointed (Porto Rico).....19. *T. Stahlii*.
- KK. Calyx-lobes usually rounded or obtuse.
- L. Leaves with 12 or 13 pairs of veins, clearly visible on the lower surface (Jamaica).....20. *T. granulata*.
- LL. Leaves with 5-8 pairs of veins, usually inconspicuous on the lower surface.
- M. Leaves rounded or very obtuse at the base; petiole 6-12 mm. long; fruit semi-oval (Jamaica).....21. *T. Hartii*.
- MM. Leaves attenuate at the base; petiole 3-7 mm. long; fruit conical (Cuba, Haiti, Santo Domingo, Porto Rico, St. Jan, St. Eustatius, Guadeloupe, Martinique).....22. *T. peduncularis*.

1. *Ternstroemia pubescens*, sp. nov.

Ramuli grisei, glabri, hornotinis brunnescentibus breviter villosis. Folia elliptica vel obovata, apice ramulorum congesta, coriacea vel subcoriacea, (2.5-) 5-6 cm. longa et 1.5-3.0 cm. lata, supra glabra opaca (ut videtur rubida), subtus breviter villosa, pallidiora, apice obtusa, basi in petiolum protracta, margine integerrima vel subrevoluta, costa supra impressa (in toto manifesta), venis 5 vel 6 paribus, supra obscuris, subtus paucis manifestis, petiolis 8-14 mm. longis, villosulis. Flores parvissimi, in foliorum axillis solitarii, pedicellis 8-14 mm. longis breviter villosis, bracteolis 2 oppositis vel suboppositis ca. 1 mm. minusve longis villosulis triangularibus vel subtriangularibus sparse glanduloso-denticulatis; sepala 5, imbricata, subaequalia, exterioribus villosulis ca. 2.5 mm. longis et 2.0 mm. latis pergamentaceis margine glanduloso-denticulatis, interioribus glabris sublongioribus (ca. 3 mm. longis et 2 mm. latis) margine scariosis et subfimbriatis (non glanduloso-denticulatis); petala 5, imbricata, obovata, basi leviter coalita, ca. 3.5 mm. longa, quam calyce paucis longiora; stamina ca. 30, filamentis antherisque ca. 1 mm. longis; ovarium parvum, 2-loculare, glabrum, basi 1.5-2.0 mm. diam., in stylum 1.5 mm. longum attenuatum, stigmatibus bipunctiformibus. Fructus ignotus.

DISTRIBUTION: Santo Domingo.

SANTO DOMINGO: Cordillera Central, Prov. Monte Cristi, Monción, Lagunas de Cenobi, common in forest, alt. 1100 m., *E. L. Ekman H-12879* (TYPE, US), June 17, 1929.

The astounding distinguishing feature of this species is the presence of a short villous pubescence on the lower surface of the leaves, the current year's growth of branchlets, the pedicels, bracteoles and calyx-lobes. This separates the species from all others in the genus. To my knowledge it is the first record of any kind of pubescence in *Ternstroemia*. Very closely related is *T. microcalyx* Krug & Urban. In the latter species the sepals are equally as small but are entire, lacking the distinct glandular denticulations on the margin as in *T. pubescens*. Also, the petals in *T. microcalyx* are 7 mm. long, twice as long as the petals in *T. pubescens*, which barely exceed the calyx-lobes in length. In *T. microcalyx* the petiole is considerably shorter (5-8 mm.) and the attenuation of the leaf-base into the petiole is more pronounced.

2. *Ternstroemia delicatula* Choisy in Mém. Soc. Phys. Hist. Nat. Genève, **14**: 106 (Mém. Ternstr. 18), 1855. — Wawra in Martius, Fl. Bras. **12**<sup>1</sup>: 273. 1886 (excl. spec. Weddell). — Krug & Urban in Bot. Jahrb. **21**: 536. 1896. — Melchior in Nat. Pflanzenfam. ed 2, **21**: 142. 1925. — R. O. Williams, Fl. Trinidad & Tobago, **1**: 70. 1929. — Kobuski in Jour. Arnold Arb. **23**: 308. 1942.

*Mokofua delicatula* (Choisy) O. Kuntze, Rev. Gen. Pl. **1**: 63. 1891.

*Taonabo delicatula* (Choisy) Szyszyłowicz in Nat. Pflanzenfam. III. **6**: 118. 1893.

DISTRIBUTION: Trinidad, French Guiana.

TRINIDAD: Forests near Arima, alt. 600 m., *H. F. A. Eggers 1381* (NY, US). FRENCH GUIANA: Cayenne, *Martin s.n.* (ISOTYPE, FM; photos, FM, G).

This species is described as having membranaceous, obovate-elliptic leaves, narrowed at the base into a long petiole (6-15 mm. long), obtuse or very shortly acuminate at the apex, 5-9 cm. long and 2-4 cm. wide, quite distinctly crenulate in the upper half, and with lateral nerves prominu-

lous on both surfaces. The flowers are fairly numerous, crowded on the branchlets. The peduncle is slender, 1–2 cm. long, recurved. The 5 sepals are more or less equal, 5–6 mm. long, obtuse at the apex, with eglandular entire margins. The ovary is globose-conical, 3-celled, contracted into a style ca. 4 mm. long which is topped by a subcapitate tri-crenate stigma. Each cell of the fruit is single-seeded.

The membranaceous leaves, the long petiole, the crowded flowers, the thin, recurved pedicels, the eglandular sepals, and the tri-crenate, subcapitate stigma are the distinguishing characters for identification. This is the only species which is found both in South America and the West Indies. However, its closest relationship is with *T. Browniana* Kobuski of British Guiana. Both have entire, scarious-margined, eglandular, small (5 mm. long) calyx-lobes, 3-celled ovaries and fruit with a single seed to each locule, and slender pedicels. *Ternstroemia Browniana* differs in having a punctiform rather than a subcapitate, tri-crenate stigma, and in the coriaceous, veinless leaves, shorter and rounded at the apex.

3. ***Ternstroemia elliptica*** Swartz, Prodr. 81. 1788; Fl. Ind. Occ. **2**: 929. 1800. — Vahl, Symb. **2**: 61. 1791. — De Candolle in Mém. Soc. Phys. Hist. Nat. Genève, **1**: 410 (Mém. Ternstr. 18). 1822; Prodr. **1**: 523. 1824. — Choisy in Mém. Soc. Phys. Hist. Nat. Genève, **14**: 129 (Mém. Ternstr. 15). 1855. — Urban in Bot. Jahrb. **21**: 535. 1893. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925.  
*Mokofua elliptica* (Swartz) O. Kuntze, Rev. Gen. Pl. **1**: 63. 1891.  
*Amphania integrifolia* Solander Mss. ex DeCandolle in Mém. Soc. Phys. Hist. Nat. Genève, **1**: 410 (Mém. Ternstr. 18). 1822.

DISTRIBUTION: Guadeloupe, Martinique, St. Kitts, Dominica.

GADELOUPE: Trois-Rivières, alt. 300–600 m., *Père Duss* 2987 (FM, NY, US), 1893 (grand bel arbre, rare; feuillage très vert.; dans la haute région, comme à la Savane à Mulets, cet arbre reste à l'état d'arbrisseau rabougri). — Soufrière, sommets volcaniques humides, alt. 1100 m., *H. Stehlé* 322, 1023 (NY), Févr.-Sept. 1936 (2 m., arbrisseau rabougri à cette altitude). — Savane à Mulets forêt dense ventée, alt. 1100 m., *H. Stehlé* 1524 (US), 8 Février 1937 (rabougri). MARTINIQUE: Bois de Fonds Saint Denis, de Case Pilote et de la fontaine Absalon, alt. 300–600 m., *Père Duss* 638 (NY, US), 1882–1883; *Père Duss* 171 (FM, Mo, NY, US; not *Duss* 171, Berlin), 1887. ST. KITTS: Upper slopes of Mt. Misery, *N. L. Britton & J. F. Cowell* 532 (NY, US). DOMINICA: *Dr. Imray* 280 (G, sterile) (fide Urban).

This species is characterized by coriaceous leaves, 4.5–9.0 cm. long and 2–4 cm. wide, obovate to obovate-elliptic, granular-punctate on both surfaces, very obtuse at the apex, contracted at the base into a petiole 5–10 mm. long, the margin revolute, entire, the veins (ca. 7 pairs) obsolete or prominulous on the lower surface; peduncles 1–2 cm. long, the bracteoles ovate, the 5 sepals unequal, semiorbicular, 4–7 mm. long, ca. 5 mm. wide, the outer lobes glandular-denticulate, the petals 5, obovate, 8–10 mm. long, 6–8 mm. wide, the stamens numerous, 2–4-seriate, the filaments unequal, the inner filaments nearly 3 times longer than the anthers, the outer filaments about equal to anthers in length; ovary semiglobose or conical, 3-celled, tapering through the style to a 3-parted, evolute stigma which surpasses considerably the style in diameter; fruit three-celled, up to 18 mm. diam., the seeds few.

The characters significant in identification are: the three-celled ovary

and fruit, the 3-parted evolute stigma, the long petiole, the granular punctations on both leaf-surfaces, the very numerous stamens in 2-4 series, and the eglandular sepals and bracteoles.

Cited above is *Duss 171* from various American herbaria. Evidently this specimen must differ from *Duss 171* as found in the herbarium at Berlin, since Urban (1893) cited the number as belonging to his new species *T. oligostemon*, which, in turn, is very different from the present species.

According to the labels and dates, Duss made frequent collections over a period of years, in different localities, assigning a single number to the massed collections.

4. ***Ternstroemia parviflora*** Krug & Urban in Bot. Jahrb. **21**: 523. 1896. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925.

DISTRIBUTION: Cuba.

CUBA: Loma del Pinal Mayan, along road, *C. Wright 2110* (ISOTYPES, G, M), large bush, 10 ft.; flowers whitish rose, tinged with yellow at center. Prov. Santa Clara: Palm Barren, *N. L. Britton & J. F. Cowell 10178* (NY, US), March 1911. — Santa Clara to Loma Cruz, *N. L. Britton, E. G. Britton & J. F. Cowell 10220* (NY, US), March 23, 1911. — Palm Barren, *N. L. Britton, E. G. Britton & P. Wilson 6168* (NY, US), March 1910 (shrub 2 m.). Prov. Pinar del Rio: on top of Cajalbana, *Bros. Léon & Charles 4955* (NY), April 6, 1915 (shrub 4-5 ft.). — Hato Abajo, *J. T. Roig 3185* (G, NY, US), Apr. 7, 1924. Prov. Oriente: Along streamlets or edge of deciduous thickets, *J. A. Shafer 1282* (FM, NY, US), *1424* (FM, NY), *1691* (NY), *3189* (FM, NY, US), Apr.-Dec. 1909 (shrub 1-3 m.).

In his original description, Urban states that the ovary is one-celled, seven-ovulate. This character seems to hold for the type. However, such is not the case in all specimens. After dissecting several ovaries from each specimen, I find that *Shafer 1282* and *1691*, as well as *Britton, Britton and Cowell 10220*, possess single-celled ovaries. *Shafer 1424* and *3189*, *Bros. Léon and Charles 4955* and *Britton, Britton & Wilson 6168* have two-celled ovaries, while *Britton & Cowell 10178* have both single-celled and two-celled ovaries, with the larger number single-celled. The ovary is very minute (1 mm. or less long), conical in shape, and tapering into a style ca. 2 mm. long. Because of the surrounding subligneous calyx-lobes and the flatness of the ovary, dissections are very difficult.

The pedicels are very slender and are 2.5-3.0 cm. long. The bracteoles are ca. 2 mm. long, narrow and acute at the apex. Although not constantly so, there is a tendency for one of the bracteoles to be placed as much as 2 mm. below the sepals. Nearly every specimen shows this arrangement. The calyx-lobes are 3-5 cm. long and ovate, and the outer lobes are somewhat apiculate. The anthers also are long-apiculate (1 mm.).

Most closely allied to this species is *T. microcalyx* Kr. & Urb., which can be separated by the shorter stockier pedicel (1.0-1.5 cm. long), smaller calyx-lobes, and longer petals. The petals of *T. parviflora* scarcely exceed the calyx in length.

5. ***Ternstroemia oligostemon*** Krug & Urban in Bot. Jahrb. **21**: 534. 1896. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925. — R. O. Williams, Fl. Trinidad & Tobago, **1**: 70. 1927. — Kobuski in Jour. Arnold Arb. **23**: 327. 1942.

DISTRIBUTION: Tobago, Trinidad.

TOBAGO: The Widow, *W. E. Broadway* 4154 (FM, Mo, US), Sept. 29, 1910 (shrub with white, sweet-smelling flowers). — Easterfield, *W. E. Broadway* #369 (FM), Dec. 16, 1912 (bark of trunk rough and dark in color; leaves glossy-green). — Slopes of main ridge above Parlatuvier, relict forest bordering cultivations, *N. Y. Sandwith* 1916 (NY), Oct. 24, 1937 (middle-sized tree with white flowers). — Exact locality missing, *F. A. "Durity"* 12620 (NY), Jan. 21, 1932.

This species is characterized by obovate or narrowly obovate-elliptic leaves, 6–10(–14) cm. long and 2.5–5.0 cm. wide, shortly or obtusely acuminate at the apex, long-attenuately tapering at the base into a petiole 8–13 mm. long, the margin subrevolute, crenulate or occasionally entire, frequently glandular, the 10–15 pairs of rather straight veins conspicuous on the lower surface, sometimes obsolete above; the texture of the leaves is thick-chartaceous and the surface is free from granular punctations. The flowers are white with a sweet odor and the pedicels measure 1.0–2.5 cm. in length. The sepals are suborbicular, 5–6 mm. long and about 5 mm. wide and, like the narrowly ovate bracteoles, devoid of glandular denticulations. The petals are about 7 mm. long. The stamens (ca. 20) are about 5 mm. long, the filaments measuring only 1 mm. in length while the anthers are 4 mm. long, linear, and taper gradually to the apex. The ovary is conical, 4-celled, each cell having one or two ovules and tapering into the style, which is crowned by an entire stigma slightly exceeding the style in diameter. The fruit is globose, 12–20 mm. in diameter, 4-celled with one or two seeds in each cell, only one of which usually fully matures.

One of the types of this species, as cited by Krug and Urban, is *Père Duss* 171 from Martinique. Before me are several specimens of this collection (supposed isotypes, FM, Mo, NY, US), which belong not to this species, but to *T. elliptica*. Perhaps there may be some confusion in the label of the Berlin specimen, since all seven sheets of *Duss* 171 in American herbaria are true *T. elliptica*. On the label of two specimens in the New York and U. S. National herbaria are two numbers, 171 and 638. There is no difference in the material, but *Duss* 638 has been cited by Urban under *T. elliptica*. I doubt very much whether *T. oligostemon* actually grows in either Martinique or Guadeloupe, from which it has been cited. Williams cites material from Trinidad (none of which I have seen), and this, with that from Tobago, perhaps gives the correct geographical distribution for the species.

Krug & Urban's description is very complete. They state, however, that the ovary and fruit are 2-celled or incompletely 4-celled and that the number of ovules and seeds in either case is four. All material sectioned by me showed the ovary and fruit to be clearly 4-celled, with one or two ovules in each cell. In the first, eight seeds were found, four of which were fully mature, while the other four, although immature, were of considerable size. In other cases, a single seed was found in each cell.

The distinguishing characters of *T. oligostemon* are the four-celled ovary and fruit, the eglandular sepals and bracteoles, the entire stigma, and the 10–15 pairs of lateral veins of the thick-chartaceous leaves. Its closest ally is *T. delicatula* of Trinidad and French Guiana. This latter species can be

distinguished by the 3-celled ovary, the tricrenate stigma, and the thin papery leaves with 7 or 8 pairs of lateral veins.

6. ***Ternstroemia heptasepala*** Krug & Urban in Bot. Jahrb. **21**: 530. 1896. — Urban, Fl. Ind. Occ. **4**: 411. 1910. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925. *Taonabo heptasepala* (Kr. & Urb.) Britton in Britton & Wilson, Sci. Surv. Porto Rico & Virgin Isl. **5**: 581. 1924.

DISTRIBUTION: Porto Rico.

PORTO RICO: Sierra de Luquillo, in planitie montis Jiminez, *P. Sintenis 1425* (ISOTYPES, FM, G, Mo, NY, US), June-July 1885. — Luquillo Mts., *P. Wilson 151* (FM, NY), July 1902. — Yunque, *W. E. Hess & F. L. Stevens 2949* (NY), Aug. 28, 1913.

According to the name and Urban's subsequent interpretation, this species is characterized by seven sepals and a single pair of bracteoles. However, to my mind, the more correct interpretation is to consider the flower as having the customary number of sepals (five) and two pairs of bracteoles. The outer pair of bracteoles are unequal, opposite, ovate or triangular, keeled, eglandular, and about 1 mm. long. The bracteoles of the second or inner pair alternate with those of the outer pair and are subrotund, measuring 2 mm. or less in length, being also eglandular. The sepals themselves are imbricate, eglandular, subrotund, varying from 3–5 mm. in length. The pedicels are curved, 10–18 mm. long.

Closely allied is *T. subsessilis*, which can be separated by the single pair of bracteoles, the two-parted style, and the subsessile flowers.

7. ***Ternstroemia subsessilis*** (Britton), comb. nov.

*Taonabo subsessilis* Britton in Britton & Wilson, Sci. Surv. Porto Rico & Virgin Isl. **5**: 581. 1924.

DISTRIBUTION: Porto Rico.

PORTO RICO: Luquillo Mts., rocky summit of Mt. Yunque, *N. L. Britton & E. M. Bruner 7627* (NY, TYPE), Feb. 1923 (shrub 1 m. high; petals white, 1 cm. long). — Sierra de Naguabo, Río Prieto and adjacent hills, thickets at top of peak, alt. 1000 m., *J. A. Shafer 3648* (NY, US), Aug. 1914 (small tree 1–2 m.).

This interesting species is characterized by sessile or subsessile flowers and fruit. This character, along with the two-parted style, is sufficient to separate *T. subsessilis* from all other species of the genus in the West Indies. The suborbicular eglandular calyx-lobes are very minute, the inner lobes not over 3 mm. and the outer lobes about 2 mm. long. The bracteoles resemble the calyx-lobes in shape but seldom measure over 1 mm. in length. Britton states that the calyx-lobes (inner) measure 5 mm. and the petals measure 10 mm. In the type specimen I could find no calyx-lobes measuring more than 3 mm. and the petals were lacking. The fruit is conical, tapering to a decided point. Because of the lack of material, no dissections have been made to determine the number of cells of the ovary and the number of ovules.

8. ***Ternstroemia calycina*** Fawcett & Rendle in Jour. Bot. **60**: 363. 1922, Fl. Jam. **5**: 184. 1926. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925.

DISTRIBUTION: Jamaica.

JAMAICA: *W. Harris 10979, 11035* (ISOTYPES, NY).

Long ovate calyx-lobes (13–17 × 9–12 mm.) and bracteoles (7–9 mm. long) are the distinctive characteristics of this species. The calyx-lobes

are glandular-denticulate, while the bracteoles are distinctly eglandular. The pedicels are rather short (1.5–2.0 cm. long), and the leaves are obovate-elliptic, rounded or very obtuse at the apex, sharply contracted at the base into a petiole 5–8 mm. long.

9. ***Ternstroemia rostrata*** Krug & Urban in Bot. Jahrb. **21**: 533. 1896. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925. — Fawcett & Rendle, Fl. Jam. **5**: 184. 1926.

DISTRIBUTION: Jamaica.

JAMAICA: *W. Harris* 10259 (FM, NY, US); 10317 (FM, NY, US); *N. L. Britton* 2339 (NY); *N. L. Britton & A. Hollick* 2168 (NY).

The fruit of this species is spheroidal or roundish-ovoid, rostrate at the apex. Krug & Urban record the pedicel as 3–5 cm. long. In all the specimens cited above, the pedicels are 6–8 cm. long, seldom less, and as much as 3 mm. diameter at the apex. The calyx-lobes are intermediate between those of *T. granulata* and *T. calycina* (10–12 [–14] × 7–10 mm.) in size and are eglandular. The bracteoles are comparatively minute, measuring not over 3 mm. in length, and acuminate. The leaves are obovate to obovate-elliptic, 7–12 cm. long, 3.0–5.5 cm. wide, obtuse, and occasionally emarginate at the apex, tapering at base into a petiole 5–7 mm. long.

10. ***Ternstroemia luquillensis*** Krug & Urban in Bot. Jahrb. **21**: 531. 1896. — Urban, Fl. Ind. Occ. **4**: 411. 1910. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925. *Taonabo luquillensis* (Kr. & Urb.) Britton in Britton & Wilson, Sci. Surv. Porto Rico & Virgin Isl. **5**: 580. 1924.

DISTRIBUTION: Porto Rico.

PORTO RICO: Sierra de Luquillo, in monte Jimenez, in silvis, *P. Sintensis* 1523 (ISO-SYNTYPES, M, NY, US), 1331 (ISO-SYNTYPES, G, NY, US), July-Aug. 1885. — Sierra de Luquillo, in woods, alt. 600 m., *H. F. A. Eggers* 1224 (US), May 1883.

Most species of *Ternstroemia* are characterized by obovate leaves. In this species the leaves are elliptic, up to 12 cm. long, usually 2.5–3.5 times longer than broad, acute at the apex rather than obtuse or rounded, with black punctate dots on the lower surface. The midrib above is impressed the whole length of the leaf. The margin is entire, flat or slightly recurved. The pedicels are slender, 3–9 cm. long, usually compressed. The bracteoles are ovate or suborbicular, 4–5 mm. long, 3–5 mm. wide, with a midrib evident near the apex and prolonged into a short apicule. The sepals are unequal, up to 9 mm. long and 11 mm. wide, and eglandular.

11. ***Ternstroemia Barkeri*** Ekman & Schmidt in Rep. Spec. Nov. **24**: 78. 1927.

DISTRIBUTION: Haiti.

HAITI: Massif de la Hotte, western group, Torbec, top of M. Formond, alt. 2225 m., *E. L. Ekman* H-7483 (ISOTYPE, US), Jan. 1, 1927.

This species is characterized by broadly elliptic (or rarely broadly ovate-elliptic) nearly rotund leaves, 3–4 cm. long and 3–4 cm. wide, rounded and lightly emarginate at the apex, obtusely and abruptly contracted at the base into a petiole 3–5 mm. long, with the margin revolute, entire or nearly so, and the veins inconspicuous. The pedicels are 2–4 cm. long. The bracteoles are unequal, one subrotund, the other triangular, ca. 3 mm. long,



2–3 mm. wide, entire, not glandular-denticulate. The calyx-lobes are subequal, 8–9 mm. long, 7–8 mm. wide, broadly ovate, the margins scarious without glandular-denticulations. The petals are lanceolate, acuminate, 12–13 mm. long, connate at base. The stamens number ca. 50; filaments up to 8 mm. long; anthers ca. 4 mm. long. The ovary is semi-globose, bi-loculate.

The nearest relative is *T. baracoënsis* O. C. Schmidt, which can be separated from the present species by the glandular-denticulate bracteoles and calyx-lobes, the very short pedicels (5–6 mm.), and the conspicuous veins.

12. **Ternstroemia Nashii** Urban in Rep. Spec. Nov. **13**: 466. 1915, Fl. Ind. Occ. **8**: 436. 1920. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925.

DISTRIBUTION: Haiti.

HAITI: Marmelade, Camp No. 4, pineland, alt. 850 m., *G. V. Nash & N. Taylor 1307* (ISOTYPE, NY), Aug. 1–2, 1905 (shrub 1–2 m.). — Massif du Nord, Marmelade, Jalouisière, alt. 1000 m., *E. L. Ekman H-8254* (US), May 24, 1927.

The outstanding feature of this species is the presence of the long bracteoles (up to 6 mm.), by which it can be quickly separated from *T. peduncularis* DC., its nearest relative. The leaves of *T. Nashii* are coriaceous, obovate-elliptic to obovate, 4–7 cm. long and 1.5–3.0 cm. wide, rounded at the apex and tapering at the base into a petiole 2–3 mm. long, the margin revolute and glandular-punctate, the veins inconspicuous. The peduncles (3.5–5.0 cm.) immediately suggest *T. peduncularis*, but the linear, glandular-denticulate bracteoles mentioned above distinguish it. The calyx-lobes are unequal, apiculate, up to 10 mm. long and 7–9 mm. wide, glandular-denticulate. The ovary and fruit are globular, tapering into the style.

Urban suggests a relationship between this species and his *T. apleura*. The type specimen resembles the type specimen of *T. apleura*. However, subsequent collections show larger leaves with more conspicuous veining.

13. **Ternstroemia Selleana** Ekman & Schmidt in Rep. Spec. Nov. **24**: 79. 1927.

DISTRIBUTION: Haiti.

HAITI: Massif de la Selle, gr. Crete-au-Piquants, Port-au-Prince, top of M. Malanga, alt. 1475 m., *E. L. Ekman H-7391* (ISOTYPE, US), Dec. 16, 1926. — Massif de la Selle, Ganthice, along path Badeau to Saltrou, alt. 2000 m., *E. L. Ekman H-3101* (US), Jan. 27, 1925.

This species is characterized by small, broadly obovate or suborbicular leaves, usually 2–3 cm. long (rarely 3.5 cm.) and ca. 2 cm. wide, rounded (or nearly so) and lightly emarginate at the apex, attenuated at base into a petiole 4–5 mm. long, the margin revolute, slightly denticulate and plane toward the apex, the veins 4 or 5 pairs (inconspicuous in *Ekman H-3101*). In the type specimen the pedicels vary from 1.0–1.5 cm. in length; however, in *Ekman H-3101* the pedicels are considerably shorter (0.5–0.8 cm.). The bracteoles are unequal, 1.0–1.5 mm. long, scarious-margined and sparsely (if at all) glandular-denticulate. The calyx-lobes are unequal and suborbicular, the outer lobes smaller, ca. 2.5 mm. long, sparsely glandular-denticulate, the inner lobes 3.0–3.5 mm. long, the margin scarious. The young fruit is conical, up to 1 cm. long and only one-half as wide.

The nearest relative is *T. gracilifolia* O. C. Schmidt. This latter species can be separated by the longer pedicels and bracteoles, the larger, triangular calyx-lobes, and the semi-globose fruit.

14. ***Ternstroemia gracilifolia*** O. C. Schmidt in Rep. Spec. Nov. **22**: 95. 1925.

DISTRIBUTION: Haiti.

HAITI: Massif de la Selle, Pétionville, M. La Visite, alt. 2050 m., *E. L. Ekman H-1410* (ISOTYPE, US), Aug. 9, 1924.

This species is characterized by small, coriaceous, spatulate leaves, 1.5–3.0 cm. long and 1.5–2.2 cm. wide, rounded at the apex, narrowed at the base into a petiole 2–3 mm. long, the margin both revolute and glandular-denticulate along the entire length, the veins inconspicuous. The pedicels are 2.0–3.5 cm. long. The bracteoles are long-deltoid, ca. 3 mm. long, carinate, glandular-denticulate. The calyx-lobes are unequal, the outer lobes subcordate-triangular, ca. 6 mm. long and 5 mm. wide, strongly glandular-denticulate, the inner lobes slightly longer, somewhat apiculate at the apex, and scarious-margined. The immature fruit is globose.

Closely allied is *T. Selleana* Ekm. & Schmidt, which can be separated by the smaller, rounded bracteoles and calyx-lobes, only sparsely, if at all, glandular-denticulate, the shorter pedicels, the elongated fruit, and the leaf margin plane and denticulate only at the apex.

15. ***Ternstroemia flavescens*** Grisebach, Cat. Pl. Cuba, 35. 1866. — Sauvalle, Fl. Cub. 10. 1873. — Urban in Bot. Jahrb. **21**: 530. 1896. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925.

*Ternstroemia clusiifolia* Grisebach, Pl. Wright. 166. 1860. — Non H.B.K.

*Taonabo flavescens* (Griseb.) Szyszylowicz in Nat. Pflanzenfam. III. **6**: 189. 1893.

DISTRIBUTION: Cuba.

CUBA: Near Mont Verde, *C. Wright 1124* (ISOTYPE, NY). — Prov. Oriente: Camp La Gloria, south of Sierra Moa, *J. A. Shafer 8200* (NY), Dec. 1910 (straggling shrub 1 m.).

The very small, thick-coriaceous, ovate to broadly ovate leaves ( $2.4 \times 1.0$ – $1.5$  cm.) and the small flowers are the outstanding distinguishing characters of this species. The nearest relative is *T. baracoënsis* Schmidt, the leaves of which are considerably larger and subrotund.

16. ***Ternstroemia baracoënsis*** O. C. Schmidt in Rep. Spec. Nov. **22**: 95. 1925.

DISTRIBUTION: Cuba.

CUBA: Prov. Oriente: Lomas de Cuaba, near Baracoa, in pines, *E. L. Ekman 4230* (photo of isotype, NY), Jan. 13, 1925.

A photograph of the isotype (Stockholm) with a few leaves (NY) are the only available material for study. Close observation shows flowers to be present on the isotype. According to the description and the photograph, the outstanding characteristics are (1) the broadly elliptic or nearly rounded, coriaceous leaves, 3–5 cm. long and 1.8–3.0 cm. broad, rounded at the apex, obtusely contracted at the base into the petiole, the margin entire, slightly revolute, the midrib flat above, fading out toward the apex, raised below, the veins (5 or 6 pairs) tenuous and conspicuous below; (2) the pedicel short, 0.5–0.6 cm. long; (3) the bracteoles subcordate(?).

The nearly rounded leaves, the tenuous veins, and the very short pedicels are characters which clearly distinguish the species from its Cuban relatives. This species is probably the only Cuban species whose leaves are not twice as long as broad. Unfortunately, the description of the flowers was drawn only from buds and proved of little aid. Schmidt remarked that the bracteoles were subcordate; this seems very dubious.

The nearest relative of this species is *T. flavescens* Griseb. However, the latter species has much narrower leaves with inconspicuous veining and longer pedicels (1.0–2.5 cm.).

17. ***Ternstroemia cernua*** Grisebach, Cat. Pl. Cuba, 35. 1866. — Sauvalle, Fl. Cub. 10. 1873. — Urban in Bot. Jahrb. **21**: 529. 1896. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925.

*Taonabo cernua* (Griseb.) Szyszylowicz in Nat. Pflanzenfam. III. **6**: 189. 1893.

DISTRIBUTION: Cuba.

CUBA: Prov. Pinar del Rio: near Retiro and Sumdero, *C. Wright* 2112 (ISOTYPES, G, NY, US).

This species is characterized by obovate or elliptic-oblong, coriaceous leaves, nearly three times longer than broad (5–8 × 2–3 cm.), with 6–8 pairs of veins visible on the under surface. The petiole exceeds that of most species in length (5–10 mm.). The short, thick, recurved pedicels (0.4–1.0 cm. long and 1.5 mm. thick) also distinguish this species. The sharply pointed triangular bracteoles and the ovate, acuminate calyx-lobes are added features which separate this species from *T. peduncularis* DC.

18. ***Ternstroemia microcalyx*** Krug & Urban in Bot. Jahrb. **21**: 531. 1896. — O. C. Schmidt in Rep. Spec. Nov. **22**: 96. 1925. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925. — Non Airy-Shaw, 1939.

*Ternstroemia elliptica* Grisebach, Pl. Wright. 166. 1860, Cat. Pl. Cuba, 35. 1866. — Non Swartz.

DISTRIBUTION: Cuba, Haiti.

CUBA: Oriente, near La Guinea, *C. Wright* 1577 (ISOTYPES, G, NY), Dec. 17, 1859 (tall shrub). — Southern Oriente and Pico Turquino, *Fr. Leon* 10737, 11073 (NY), July 1922. — Oriente, Sierra Maestra, alt. 1200 m., *J. Roig & Bucher* 6901 (NY), July 1935. — Oriente, Sierra Maestra, *Bucher* (244) 5720 (NY), July 8, 1931. HAITI: Massif du Nord, Anse-i-Foleur, top of Mt. Colombos, alt. 900 m., *E. L. Ekman* H-4342 (US), June 20, 1925. — Massif du Nord, Port-de-Paix, summit of Haut-Piton, alt. 1205 m., *E. L. Ekman* H-4623 (US), Aug. 9, 1925.

The leaves of this species are thin-coriaceous, obovate-elliptic or elliptic-oblong, 4.5–7.5 cm. long and 1.5–3.0 cm. wide, obtuse or obtusely acuminate at the apex, narrowing at the base into a petiole 5–8 mm. long. The leaf-margin is plane and usually entire, with occasional slight evidences of serration near the apex. The midrib is narrowly and deeply sulcate the whole length of the leaf above, raised below with 3–5 pairs of obscure nerves evident on the lower surface. The pedicels are 1.0–1.5 cm. long and the small suborbicular bracteoles are less than 1 mm. long. The calyx-lobes are minute, measuring 3 mm. or less in length, rounded at the apex, with the margin of the outer lobes entire or occasionally obscurely glandular-denticulate. According to a subsequent observation by Urban, the petals far exceed the calyx in length, measuring 7 mm. long.

A close relative is *T. parviflora*, which can easily be distinguished by the usually single-celled ovary and fruit, the longer peduncle (2.5–3.0 cm. long), and the petals exceeding the calyx in length. Another closely related species is *T. pubescens*. The calyx-lobes, bracteoles, pedicels, lower surface of the leaves, and the young branchlets of this latter species are covered with a soft villous pubescence. Also, the petals measure only 3 mm. long, barely exceeding the calyx in length, and the bracteoles and outer calyx-lobes are sharply glandular-denticulate, with the inner lobes scarious and subfimbriate.

In 1939, Airy-Shaw (Kew Bull. 506) described *T. microcalyx* from Sarawak, apparently overlooking Krug & Urban's earlier species of the same name. No material of Airy-Shaw's species is available for my study, and since, as he states, his new species is so very closely allied to *T. Robinsonii* Merrill from Amboina, I merely wish to draw attention to this later homonym rather than suggest a new combination.

19. ***Ternstroemia Stahlii*** Krug & Urban in Bot. Jahrb. **21**: 527. 1896. — Urban, Fl. Ind. Occ. **4**: 410. 1910. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925.  
*Ternstroemia pachyphylla* Krug & Urban in Bot. Jahrb. **21**: 529. 1896. — Urban Fl. Ind. Occ. l. c. — Melchior, l. c. — Syn. nov.  
*Taonabo Stahlii* (Krug & Urban) Britton in Britton & Wilson, Sci. Surv. Porto Rico & Virgin Isl. **5**: 581. 1924.  
*Taonabo pachyphylla* (Krug & Urban) Britton, l. c.

DISTRIBUTION: Porto Rico.

PORTO RICO: *N. L. Britton & E. G. Britton 9512, 9636, 9923, 9924* (NY). — *N. L. Britton & J. F. Cowell 1556* (NY, US). — *N. L. Britton, F. L. Stevens & W. E. Hess 2445* (NY, US). — *E. G. Britton & D. W. Marble 722* (FM, NY, US). — *P. Sintenis 349* (G, ISOTYPE of *T. pachyphylla*). — *W. E. Hess 3863* (NY). — *A. A. Heller 4545* (AA, FM, G). — *J. A. Stevenson 2118* (NY, US). — *L. R. Holdridge 38* (NY).

The leaves are obovate, thick-coriaceous, 4–7 cm. long, rounded at the apex, tapering at the base into a stout petiole, 3–5 mm. long; the midrib is quite flat on the upper surface, fading out toward the apex, raised below; the surface is distinctly granular below; the margin is flat, occasionally remotely denticulate. The pedicels are stout, 5–12 mm. long. The bracteoles are long-triangular, 2.5–3.5 mm. long, 1.0–1.5 mm. wide at the base, glandular-denticulate. The calyx-lobes are ovate, distinctly acute, occasionally decidedly acuminate, the outer lobes being glandular-denticulate. The sharp apex of the calyx-lobes is an excellent diagnostic character.

*Ternstroemia pachyphylla* Krug & Urban is undoubtedly a synonym of this species. In the type specimen the petioles and pedicels are slightly shorter. However, in all other respects the two species are identical. *Heller 4545*, identified by Urban (1910) as *T. Stahlii*, is identical with the type of *T. pachyphylla*.

20. ***Ternstroemia granulata*** Krug & Urban in Bot. Jahrb. **21**: 534. 1896. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925. — Fawcett & Rendle, Fl. Jam. **5**: 182. 1926.

DISTRIBUTION: Jamaica.

JAMAICA: *Purdie s.n.* (probable iso-syntype, G).

This species is characterized by obovate-elliptic leaves, 7–9 cm. long and

3–4 cm. wide, densely granular-punctate on both surfaces, obtuse at the apex, tapering quite abruptly at the base into a petiole 8–10 mm. long, with the midrib evident the entire leaf-length on both surfaces and 12 or 13 pairs of veins, clearly evident on the lower-surface; pedicels 3.5–4.5 cm. long, the bracteoles 2, suborbicular, 4–5 mm. long, 3–4 mm. wide, glandular-denticulate, not keeled (Purdie); sepals 5, subequal, somewhat orbicular, 8–9 mm. long, 8–11 mm. wide, glandular-denticulate (outer sepals); petals 5, 12–13 mm. long, 8–9 mm. wide.

*Purdie s.n.* (G) is probably an iso-syntype of *T. granulata*, as originally formulated by Krug & Urban. This specimen has densely granular-punctate leaves, from which the species derives its name. However, the description calls for bracteoles which are more or less carinate on the dorsal surface. On bracteoles of the specimen cited above there is no evidence of a keel. Later (1908), Urban determined questionably a specimen collected by Prior near Brownstown. This specimen lacks any vestige of granular punctation on the leaves, and here also there is no evidence of a keel on the bracteoles.

Fawcett & Rendle included both these entities under *T. granulata* in their treatment of the Ternstroemiaceae for the *Flora of Jamaica*. Besides the leaves, the larger flowers (both calyx and corolla) and the larger number (12 or 13 pairs) of clearly visible veins should clearly distinguish this species from *T. Hartii*, its nearest relative.

21. **Ternstroemia Hartii** Krug & Urban in Bot. Jahrb. **21**: 532. 1896. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925. — Fawcett & Rendle, Fl. Jam. **5**: 182. 1926.

DISTRIBUTION: Jamaica.

JAMAICA: St. Georges, alt. 650 m., *W. Harris 5767* (ISO-SYNTYPE, FM, NY), June 14, 1895 (tree 8 m.). — Troy, alt. 600 m., *W. Harris 8786* (NY), Aug. 1904 (tree 10 m.). — Road to Holly Mount, alt. 600 m., *W. Harris 8987* (AA, FM, NY), Aug. 17, 1908 (small tree 6 m. with white fragrant flowers). — Ipswich, St. Elizabeth, alt. 270 m., *W. Harris 12369* (FM, Mo, NY, US), June 13, 1916 (tree 8 m.). — Summit of John Crow Peak, vicinity of Cinchona, *N. L. Britton 266* (FM, NY, US), Sept. 1906 (tree 8 m. with white flowers). — Grove Place, near Mile Gully, alt. 500 m., *W. Harris & N. L. Britton 10621* (FM, NY, US), Sept. 23, 1908 (tree 8 m.). — *J. Hart 529* (US). — Near Brownstown, *Prior s.n.* (NY).

This species is characterized by obovate or obovate-elliptic leaves, 6–11 cm. long, 3.0–5.5 cm. wide, opaque, obtuse or rounded at the apex, contracted abruptly or gradually at the base into a petiole 6–12 mm. long, with the surface free from granular punctations, the margin plane or slightly revolute and entire, and the veins obscure on both surfaces and, when visible, few in number; pedicels varying in length, 1.5–5.0 cm. long, usually somewhat carinate, the bracteoles 2, 3–5 mm. long, 2.5–3.5 mm. wide, ovate, the margin usually free from glandular denticulations; sepals 5, subequal, suborbicular, 6.0–7.5 mm. long and about as wide, the margins of the outer sepals sparsely glandular-denticulate, usually entire, scarious; petals barely exceeding the calyx in length (8 mm.).

Several of these numbers (*Prior s.n.*, *W. Harris 8786*, *8987* and *12369*, and *Harris & Britton 10621*) have been cited by Fawcett & Rendle (Fl.

Jam.) under *T. granulata*. *Prior s.n.* was determined questionably by Urban (1908) as *T. granulata*. *Ternstroemia granulata* can be separated from the present species by the dense granular punctations covering both leaf-surfaces, the highly revolute leaf-margin, and the copious (12 or 13 pairs) and clearly visible veins. The flowers are larger, especially as regards the corolla (12–13 mm.).

22. *Ternstroemia peduncularis* A. de Candolle in Mém. Soc. Phys. Hist. Nat. Genève, **1**: 409 (Mém. Ternstr. 17). 1822; Prodr. **1**: 523. 1824. — Krug & Urban in Bot. Jahrb. **21**: 526. 1896. — Boldingh, Fl. Dutch West Ind. Isl. **1**: 134. 1909, Fl. Ned. West-Ind. Eil. 285. 1913. — Urban, Fl. Ind. Occ. **4**: 410. 1910. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925.

*Ternstroemia meridionalis* Swartz, Prodr. 81. 1788. — Non Mutis.

*Ternstroemia obovalis* A. Richard in Sagra, Hist. Phys. Pol. Nat. Cuba, 221, t. 25. 1845. — Walpers, Rep. **5**: 130. 1845. — Grisebach, Cat. Pl. Cuba, 36. 1866. — Sauvalle, Fl. Cub. 10. 1873. — Krug & Urban in Bot. Jahrb. **21**: 524. 1896. — Urban, Fl. Ind. Occ. **8**: 436. 1920. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925. — Syn. nov.

*Ternstroemia obovalis* var. *excelsa* Grisebach, Cat. Pl. Cuba, 36. 1866.

*Ternstroemia obovalis* var. *ovulosa* Wright in Grisebach, Cat. Pl. Cuba, 36. 1866.

*Mokofua obovalis* (A. Rich.) O. Kuntze, Rev. Gen. Pl. **1**: 63. 1891.

*Mokofua peduncularis* (DC.) O. Kuntze, loc. cit.

*Ternstroemia peduncularis* DC. var. *stenophylla* Krug & Urban in Bot. Jahrb. **21**: 526. 1896. — Syn. nov.

*Ternstroemia obovalis* var.  $\alpha$ . *genuina* Krug & Urban, loc. cit. **21**: 524. 1896. — Syn. nov.

*Ternstroemia obovalis* var.  $\beta$ . *Lindenii* Krug & Urban, loc. cit. **21**: 524. 1896. — Syn. nov.

*Ternstroemia obovalis* var.  $\gamma$ . *minor* Krug & Urban, loc. cit. **21**: 525. 1896. — Syn. nov.

*Taonabo Leonis* Britton & Wilson in Bull. Torrey Bot. Club, **50**: 42. 1923.

*Taonabo monticola* Britton & Wilson, loc. cit. **50**: 42. 1923.

*Taonabo peduncularis* (DC.) Britton in Mem. Brooklyn Bot. Gard. **1**: 70. 1918, in Britton & Wilson, Sci. Surv. Porto Rico & Virgin Isl. **5**: 581. 1924.

*Ternstroemia apleura* Krug & Urban in Bot. Jahrb. **21**: 523. 1896. — Melchior in Nat. Pflanzenfam. ed. 2, **21**: 142. 1925. — Syn. nov.

*Ternstroemia potrerillensis* O. C. Schmidt in Rep. Spec. Nov. **22**: 94. 1925. — Syn. nov.

*Ternstroemia monticola* (Britton & Wilson) Ekman ex Schmidt in Rep. Spec. Nov. **22**: 95. 1925. — Syn. nov.

*Ternstroemia Ekmani* Schmidt in Rep. Spec. Nov. **22**: 96. 1925. — Syn. nov.

*Ternstroemia Leonis* (Britton & Wilson) Ekman ex Schmidt in Rep. Spec. Nov. **22**: 96. 1925. — Syn. nov.

*Ternstroemia rupicola* Ekman ex Schmidt in Rep. Spec. Nov. **22**: 97. 1925. — Syn. nov.

DISTRIBUTION: Cuba, Haiti, Santo Domingo, Porto Rico, St. Jan, St. Eustatius, Guadeloupe, Martinique.

CUBA: Prov. Santa Clara: *Bro. Leon* 782 (NY), 4642 (NY). — *Bros. Leon & Gustave* 5291 (NY). — *Bro. Leon & M. Roco* 8006, 8040, 8129 (NY). — *Bros. Leon & Clement* 6700 (NY). — *Bro. Leon & J. Acuna* 13040 (NY). — *E. L. Ekman* 14016 (ISOTYPE of *T. potrerillensis*, NY). — *J. T. Roig & M. Cremata* 2194, 2220 (US). — *A. Luna* 552 (NY). — *N. L. Britton & J. F. Cowell* 10263 (NY). — *L. B. Smith & A. R. Hodgdon* 3205 (G). Prov. Pinar del Rio: *E. L. Ekman* 16388 (ISOTYPE of *T. Ekmani*, NY). — *N. L. Britton, F. S. Earle & C. S. Gager* 6909 (NY). Prov. Oriente: *Bro. Leon* 10837 (NY), 10839 (TYPE of *T. monticola*,

NY), 10910 (ISOTYPE of *T. Leonis*, NY), 11076 (NY), 11193 (NY). — *C. Wright* 1125 (ISOTYPES of *T. obovalis* var. *minor*, FM, G, Mo, NY), 2111 (ISOTYPES of *T. apleura*, G, Mo, NY), 2114 (G, Mo, US). — *J. T. Roig & G. C. Bucher* 6689 (NY). — *G. C. Bucher* 88 (NY). Prov. Camaguey: *N. L. Britton & J. F. Cowell* 13277 (FM, G, NY, US). Isle of Pines: *A. H. Curtiss* 429 (FM, G, Mo, NY, US). — *Bro. Leon* 5133 (NY). — *N. L. Britton & P. Wilson* 15658 (FM, G, NY, US). HAITI: *E. C. Leonard* 7146 (NY, US), 8849 (G, NY, US). — *E. C. & G. M. Leonard* 13379 (NY, US), 15825 (G, US). — *E. L. Ekman* H-1903 (US), H-8330 (US). — *G. V. Nash* 816 (NY). — *G. V. Nash & N. Taylor* 1311 (FM, NY, US). — *O. F. Cook, C. S. Scofield & C. B. Doyle* 92 (US). — *G. S. Miller* 304 (US). SANTO DOMINGO: *E. L. Ekman* H-13043 (US). — *M. Fuertes* 1003 (NY), 1294 (FM, G, Mo). — *Eggers* 2411 (US), 2519 (NY, US). — *W. L. Abbott* 2226 (US). — *H. von Türckheim* 3401 (FM, G, Mo, NY, US). — *E. J. Valeur* 114 (US), 667 (FM, Mo, NY, US). — *C. Wright, C. C. Parry & H. Brummel* 171 (US). PORTO RICO: *P. Sintenis* 948 (FM, G, Mo, NY, US). — *N. L. Britton & J. A. Shafer* 1565 (FM, Mo, NY, US). — *H. A. Gleason & M. T. Cook* R-59 (NY). ST. JAN: *N. L. Britton & J. A. Shafer* 532 (FM, NY, US). ST. EUSTATIUS: *J. Boldingh* 323 (NY). GUADELOUPE: *Père Duss* 3651 (FM, NY, US). MARTINIQUE: *Père Duss* 1825 (FM, Mo, NY, US).

After long consideration, I find it expedient to combine under the name *T. peduncularis* DC. several formerly recognized species. The best known of these is *T. obovalis* Rich. Urban (Bot. Jahrb. **21**: 524–526. 1896) separates these two species on the granular-punctate surface of the leaves, the degree of prominence of the lateral veins, the plane or recurved margin of the leaves, the shape of the bracteoles, and the number of ovules in the ovary. None of these characters or any others listed by Urban consistently apply to either of the above mentioned entities. In the Haitian material, often on the same flower, bracteoles may be found, one of which is large and triangular-ovate, 4 mm. or more wide (far surpassing the pedicel in width), while the other is linear-acuminate, scarcely 1 mm. wide. In other specimens the larger bracteole may be subrotund. In the Santo Domingan material nearly all specimens have flowers with bracteoles equal or subequal, triangular, ca. 1.5 × 1.5 mm., while in the Cuban material the bracteoles vary from linear-lanceolate to subrotund.

The pedicel may vary from 2 to 8 cm. in length. Specimens with pedicels 8 cm. long certainly appear vastly different from specimens whose pedicels measure only 2–3 cm. Yet the gradation through a large series of specimens shows this character insufficient for specific delimitation.

Variation in veining, coupled with deciduous bracteoles, has been used as the basis of specific differentiation in *T. apleura*. Deciduous bracteoles would seem to be an excellent specific character. Still, on the isotype of *T. apleura* (*C. Wright* 2111) in the Missouri Botanical Garden all the bracteoles are present and there is also evidence of venation. In *T. peduncularis* itself, veining is often obscure, even to the extent found by Urban in *T. apleura*. On the other hand, some specimens have veins so pronounced that, influenced also by differences in leaf-shape, one would be inclined to describe another new species. Considerable variation in glandular denticulation on the bracteoles and outer calyx-lobes can be found on a single specimen. Often the age of a specimen may cause this

variation. On fruiting calyx-lobes, the glandular denticulations of the slightly scarious margin are often worn off and the margins appear revolute or fimbriate.

The species *T. apleura* Krug & Urban, *T. Ekmani* O. C. Schmidt, *T. Leonis* (Britton & Wilson) Ekman, *T. monticola* (Britton & Wilson) Ekman, *T. potrerillensis* O. C. Schmidt, and *T. rupicola* O. C. Schmidt are separated on characters scarcely sufficient for specific delimitation. All these entities have obovate or obovate-elliptic leaves, rounded, obtuse, or obtusely acuminate at the apex, and tapering at the base into a petiole which averages 4–5 mm. long. The leaves of all are coriaceous or occasionally chartaceous-coriaceous, varying in thickness. The margin is usually entire, with occasional signs of serration, and flat or somewhat revolute. The pedicels in all the above listed entities (2–3 cm. long) vary little. The bracteoles (2–3 mm. long) likewise seldom vary more than a single millimeter either way. They are all triangular or deltoid and occasionally may be considered semi-ovate (*T. rupicola*). The calyx-lobes are always subequal and range from 4 to 7 mm. long. The outer calyx-lobes are always glandular-denticulate and the inner lobes eglandular. *Ternstroemia apleura*, *T. Leonis*, *T. monticola*, and *T. rupicola* were proposed without any description of corolla and stamens. In most cases, the corolla is approximately 6–8 mm. long. Urban (Bot. Jahrb. **21**: 521–551. 1896) based his key, to a considerable degree, on the coalescence of the petals at the base. The petals measure 6–8 mm. in length, and differentiation by means of the varying amount of coalescence of petals (as follows: 1/6, 1/4, 1/3, 2/5 or 1/2), is drawing too fine a line, considering the amount of known variation in the group and also the fact that in the majority of specimens the petals are lacking. The ovary and fruit characters show similar lines of variation.

#### DUBIOUS OR LITTLE KNOWN SPECIES

***Ternstroemia buxifolia*** Ekman & Schmidt in Rep. Spec. Nov. **29**: 13. 1931.

DISTRIBUTION: Santo Domingo. No specimens studied.

According to the authors, this species is characterized by small coriaceous leaves (1.8–3.0 × 0.9–1.6 cm.), elliptic to obovate, rounded and lightly emarginate at the apex, narrowed at the base into a petiole 3–5 mm. long, with the margin recurved and the veins inconspicuous. The pedicel is short, 4–6 mm. long, and the bracteoles are semi-elliptic, ± 2 mm. long, membranaceous, fimbriate-serrulate. The sepals are unequal, the margin membranaceous-fimbriate, ± 5 mm. long and 4 mm. wide. The petals are obovate or subobovate-cordate, 5–6 mm. long, and up to 5.5 mm. wide, with the margin membranaceous and fimbriate. The stamens number about 25. The ovary is semi-ovate or subconical, ca. 1.5 mm. long, unilocular, 6-ovulate, attenuated at the apex into a style about 3.2 mm. long.

The authors of this species suggest a close relationship with the Cuban *T. parviflora* Krug & Urban, because of the single-celled ovary.



## EXCLUDED SPECIES

- Ternstroemia albo-punctata* Grisebach, Cat. Pl. Cuba, 36. 1866 = **Cleyera albo-punctata** (Grisebach) Krug & Urban in Bot. Jahrb. **21**: 537. 1896.
- Ternstroemia dentata* Sprengel ex DeCandolle in Mém. Soc. Phys. Hist. Nat. Genève, **1**: 411 (Mém. Ternstr. 19). 1822 = **Freziera undulata** (Swartz) Swartz, Fl. Ind. Occ. **2**: 974. 1800.
- Ternstroemia salicifolia* DeCandolle in Mém. Soc. Phys. Hist. Nat. Genève, **1**: 411 (Mém. Ternstr. 19). 1822 = **Freziera undulata** (Swartz) Swartz, Fl. Ind. Occ. **2**: 974. 1800.
- Ternstroemia crenata* Macfadyen, Fl. Jam. **1**: 114. 1837 = **Symplocos octopetala** Swartz, Prodr. Veg. Ind. Occ. 110. 1788.

ARNOLD ARBORETUM,  
HARVARD UNIVERSITY.